CIRRICULUM VITAE

NAME: Victor E. Marquez

CITIZENSHIP: United States

EDUCATION:

l96l		Graduated from high school
l966	B.S.,	Pharmacy, Central University of Venezuela, Caracas, Venezuela
l968	M.S.,	Medicinal Chemistry, University of Michigan, Ann Arbor, Michigan
l970	Ph.D.,	Medicinal Chemistry, University of Michigan, Ann Arbor, Michigan

POSITIONS HELD:

l970 - l97l	NIH Visiting Fellow (Sponsor: Dr. J. Hartwell), Drug Development Branch, National Cancer Institute, NIH, Bethesda, Maryland
l972 - l977	Director of Research, Laboratorios Cosmos, S.A., Caracas, Venezuela
l977 – 1988	NIH Visiting Scientist, Laboratory of Medicinal Chemistry, National Cancer Institute, NIH, Bethesda, Maryland
1988 – 1998	Deputy Chief, Laboratory of Medicinal Chemistry, National Cancer Institute, NIH, Bethesda, Maryland
1999 – 2000	Acting Chief, Laboratory of Medicinal Chemistry, National Cancer Institute, NIH, Bethesda, Maryland
2001 – 2009	Chief, Laboratory of Medicinal Chemistry, Center for Cancer Research, National Cancer Institute, NIH, Frederick, Maryland
2009- to date	Scientist Emeritus, Chemical Biology Laboratory, Center for Cancer Research, National Cancer Institute, NIH, Frederick, Maryland

PROFESSIONAL SOCIETIES:

American Chemical Society, Division of Medicinal Chemistry

American Chemical Society, Division of Organic Chemistry

American Chemical Society, Division of Carbohydrate Chemistry

International Society for Nucleosides, Nucleotides and Nucleic Acids

Victor E. Marquez

HONORS AND AWARDS

- U.S. Department of Commerce Inventor's award, 1979
- Medical Research Council Visiting Professor, Universities of Saskatchewan and Manitoba, Canada, 1984-85
- NIH Merit Award, 1992
- Gordon Conference on Purines, Pyrimidines and Related Compounds (Vice-Chair, 1993; Chair, 1995).
- National Cancer Institute, Division of Basic Sciences (DBS) Intramural Research Award, 1997.
- Pharmazie-Wissenschaftpreiss 2001 (Pharmazeutische Chemie). Sponsored by Phoenix Pharmahandel AG & Co KG, Mannheim, November 26 2001.
- Senior Biological Research Scientist (SBRS) appointment, January 2002
- Member of the Medicinal Chemistry Division Long Range Planning Committee. American Chemical Society, Division of Medicinal Chemistry. 2003-2005
- 2003 Bernard Belleau Memorial Lecturer, McGill Chemical Society, McGill University, Montreal, Canada, March 18, 2003.
- Intramural AIDS Targeted Antiviral Program (IATAP) award (co-investigator Dr. Stephen Hughes) 2005 and 2006.
- Federal Technology Transfer Act Cash Award, 1998
- Federal Technology Transfer Act Cash Award, 1999
- Federal Technology Transfer Act Cash Award, 2000
- Federal Technology Transfer Act Cash Award, 2001
- Federal Technology Transfer Act Cash Award, 2002
- Federal Technology Transfer Act Cash Award, 2003
- Federal Technology Transfer Act Cash Award, 2004
- Federal Technology Transfer Act Cash Award, 2005
- Federal Technology Transfer Act Cash Award, 2006
- Federal Technology Transfer Act Cash Award, 2007
- Federal Technology Transfer Act Cash Award, 2008

HONORS AND AWARDS (cont.)

- Leopoldo García-Colín-Scherer Medal, Mexico City, Mexico (Sept 10-14, 2007).
- Symposium Honoring Victor Marquez for His Contributions to Conformational Analysis, Nucleosides, Nucleotides and Oligonucleotides. Division of Carbohydrate Chemistry, Americal Chemical Society, 236th National Meeting, Philadelphia, PA, August 18-19, 2008.
- Vice-President of the International Society for Nucleosides, Nucleotides and Nucleic Acids (IS3NA), 2008-2010)
- Maryland Chemist of the Year 2008. Citation: In acknowledgment and appreciation of his outstanding research accomplishments in medicinal chemistry and in recognition of his significant contributions to nucleoside chemistry and synthetic organic chemistry as tools for the rational design of antitumor and antiviral agents. December 10, 2008, Towson, Maryland.
- 2008 Raymond U. Lemieux Lecture on Biotechnology, University of Alberta, Edmonton, Alberta, Canada, May 7, 2009.
- Inducted into the Medicinal Chemistry Hall of Fame, August 24, 2010.
- President of the International Society for Nucleosides, Nucleotides and Nucleic Acids (IS3NA), 2010-2012.
- University of Michigan, School of Graduate Studies, Centennial Lecturer, Interdepartmental Program in Medicinal Chemistry, October 4, 2012.
- National Cancer Institute, Certificate of Appreciation. In grateful recognition of your outstanding contributions to research and innovation in FY 2013. Bethesda, MD, January 14, 2014.

Victor E. Marquez

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2. **Marquez, V.E.**; Twanmoh, L.M.; Wood, H.B.; Driscoll, J.S. Intramolecular cyclizations leading to N-bridgehead bicyclics. 5,5-Diphenylhydantoin derivatives. J. Org. Chem. **l972**, 37, 2558-256l

3. **Marquez, V.E.**; Twanmoh, L.M.; Wood, H.B.; Driscoll, J.S. Two modes of reductive ring opening in 2,3-dihydro-6,6-diphenylimidazo-[2,l-b]-oxazole-5(6H)-one. J. Heterocycl. Chem. **l972**, 9, ll45-ll46

4. **Marquez, V.E.**; Cranston, J.W.; Burckhalter, J.H.; Kier, L.B.; Ruddon, R.W. Binding to DNA and inhibition of RNA polymerase by analogs of chloroquine. J. Med. Chem. **l974**, l7, 856-862

5. Peng, G.W.; **Marquez, V.E.**; Driscoll, J.S. Potential central nervous system antitumor agents. Hydantoin derivatives. J. Med. Chem. **l975**, l8, 846-849

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11. **Marquez, V. E**. The properties of Locked Methanocarba Nucleosides in Biochemistry, Biotechnology and Medicine, Chapter 12. In: Modified Nucleosides in Biochemistry, Biotechnology and Medicine, P. Herdewijn Ed. Wiley-VCH, **2008**, pp 307-341.
12. Thompson, A.; **Marquez, V. E**. Synthesis of a North-Methanocarba-Thymidine (N-MCT) Analog. Current Protocols in Nucleic Acid Chemistry 2012, 1.29.1-1.29.14.

INVITED LECTURES

1. NCI Clinical Oncology Program Combined Rounds, Clinical Center, NIH, Bethesda, MD, September 25, 1985. Current trends in antitumor drug design.
2. Food and Drug Administration, Rockville, MD, Center for Drugs and Biologics, Drug Manufacturing and Control Seminar, January 8, 1987. Drug design strategies in cancer chemotherapy.
3. Florida A&M University, College of Pharmacy and Pharmaceutical Sciences, Tallahassee, FL, March 26, 1987. Cyclopentene-containing nucleosides as potential antitumor and/or antiviral agents.
4. Virginia Polytechnic Institute and State University, Department of Biochemistry and Nutrition, September 14, 1987. Cyclopentene containing nucleosides: antitumor and antiviral activity.
5. NIC/DTP Contractor's Workshop, Downingtown, PA, October 6, 1987. 2-D NMR: Introduction and Examples.
6. JUC Pharm Sci '97 Symposium, Honolulu, Hawai, December 17, 1987. Cyclopentene carbocyclic nucleosides. Synthesis and importance as antitumor and antiviral agents.
7. E. I. du Pont de Nemours & Co., Central Research and Development Department, Experimental Station, Wilmington, Delaware, March 4, 1988. Design, synthesis, and antiviral activity of nucleoside and nucleotide analogues.

INVITED LECTURES (cont.)

8. Division of Carbohydrate Chemistry and Medicinal Chemistry, American Chemical Society, Symposium on Nucleotide Analogues as Antiviral Agents, Los Angeles, CA, September 25, 1988. Design, synthesis, and antiviral activity of nucleoside and nucleotide analogues.

9. Laboratory of Biological Chemistry, National Cancer Institute, National Institutes of Health, Bethesda, MD, October 27, 1988. Approaches to the synthesis of oligonucleotides containing 5-azacytosine at specific CpG sites and their biological significance.

10. Food and Drug Administration, Rockville, MD, Center for Drug Evaluation and Research, Drug Chemistry, Manufacturing and Control Seminar, January 12, 1989. Effect of fluorine substitution on the anti-HIV activity of dideoxynucleosides.

11. Montana Academy of Sciences, and College of Letters and Science, Montana State University, Bozeman, Montana, April 22, 1989. AIDS: A MONTANA PERSPECTIVE. Keynote Lecture: Synthesis and development of new AIDS drugs at the National Institutes of Health.

12. The University of Rhode Island, Department of Medicinal Chemistry, College of Pharmacy, Kingston, RI, April 28, 1989. Ring-expanded analogues of oxetanocin as potential anti-HIV agents.

13. National Institutes of Health, National Cancer Institute, Frederick Cancer Research Facility, Frederick, MD, June 16, 1989. Ring-enlarged oxetanocin analogues as potential inhibitors of HIV infectivity.

14. Michigan Cancer Foundation, Department of Chemistry, Detroit, MI, November 2, 1989. Nucleoside analogues with antitumor and antiviral activities.

15. University of Rochester, Medical Center, Department of Biophysics, Rochester, NY, May 17, 1990. Toward rational drug design: synthesis of rigid analogues of diacylglycerol and their interaction with the phorbol receptor.

16. Florida Institute of Technology, Department of Biological Sciences, Melbourne, FL, May 24, 1990. Gamma lactones as rigid analogues of diacylglycerol (DAG) and their interaction with the phorbol receptor.

17. Nucleic Acids Symposium Series, Symposium on Nucleic Acid Technology, Nagoya, Japan, November 9, 1990. Synthesis and biological activity of novel carbocyclic nucleosides.

INVITED LECTURES (cont.)

18. Burroughs Wellcome Co. Research Triangle Park, NC, March 4, 1991. Cyclopentenycytosine a carbocyclic nucleoside with antitumor and antiviral properties.

19. Department of Chemistry, University of Iowa, Iowa City, Iowa, March 15, 1991. Synthesis of carbocyclic nucleosides.

20. Department of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, The University of Georgia, Athens, GA, April 5, 1991. Synthesis and biological activity of novel carbocyclic nucleosides.

21. Lombardi Cancer Research Center, Georgetown University Medical Center, Washington, DC, November 15, 1991. Conformationally constrained analogues of diacylglycerol (DAG) as activators/inhibitors of protein kinase C.

22. Department of Chemistry, College of Humanities and Sciences, Virginia Commonwealth University, Richmond, VA, November, 21, 1991. Conformationally constrained analogues of diacylglycerol (DAG) as activators/inhibitors of protein kinase C.

23. Division of Carbohydrate Chemistry, American Chemical Society, Symposium on Nucleosides as Antitumor and Antiviral Agents: Tohru Ueda Memorial Symposium, April 7, 1992, San Francisco, CA. Conformational studies and anti-HIV activity of mono and difluorodideoxy nucleosides.

24. Memorial Sloan-Kettering Cancer Center, New York, NY, May 12, 1992. Conformational studies and anti-HIV activity of mono and difluorodideoxy nucleosides.

25. ICI's Pharmaceutical lecture, Medicinal Chemistry Department, The University of Michigan, Ann Arbor, MI, November 12, 1992. Bis-□-butyrolactons as tools to understand the mechanism of activation of protein kinase C by diacylglycerol (DAG).

26. 25th Royal Spanish Chemical Society Meeting, Symposium of Organic and Pharmaceutical Chemistry, Faculty of Pharmacy, Vitoria-Gasteiz, Spain, September 25, 1994. The design of ultrapotent protein kinase C (PK-C) agonists based on a constrained diacylglycerol (DAG) template.

27. Division of Carbohydrate Chemistry, American Chemical Society, Symposium on Carbohydrate Based HCMV Therapeutics, April 15, 1997, San Francisco, CA. The bicyclo[3.3.0]hexane template as a carbohydrate surrogate for the construction of anti-HCMV nucleosides.

INVITED LECTURES (cont.)

28. Proceedings of International Symposium on New Drug Development. The Research Institute of Pharmaceutical Sciences, College of Pharmacy, Ewha Womans University, Seoul, So. Korea, April 18, 1997. (1,S,2R)-[(Benzyloxy)methyl]cyclopent-3-enol. A Versatile Synthon for the Preparation of "Northern" 4',1'a-Methano and "Southern" 1',1'a-Methano Carbocyclic Nucleosides. Structure-activity Relationships of Conformationally Constrained Nucleosides.

29. Therapeutic Oligonucleotide Interest Group Seminar. National Institutes of Health, Bldg. 30, Rm 117, Bethesda, MD, May 29, 1997. Oligonucleotides Containing 5,6-Dihydro-5-aza-cytidine at CpG Sites Can Produce Potent Inhibition of DNA Methyltransferase Without Covalently Binding to the Enzyme.

30. Seminars on "Advances in Nucleic Acid Research", Department of Bioorganic Chemistry, Biomedical Center, Uppsala University, Sweden, September 2, 1997. The Dickerson-Drew Dodecamer Revisited. The Effect of Fluorine-Induced Sugar Puckering on the Conformation and Stability of the Dickerson-Drew Dodecamer.

31. International Conference on "Nucleic Acids and Related Macromolecules: Synthesis, Structure and Applications" Ulm University, Germany, September 4-9, 1997. Conformatinally Rigid AZT Carbocyclic Nucleosides and their Interaction with Reverse Transcriptase.

32. Nabi Corporation, 12280 Wilkins Avenue, Rockville, MD, September 24, 1997. Conformationally Constrained Carbocyclic Nucleosides.

33. NIH Research Festival 1997, Workshop on Oligonucleotide Therapeutics: Molecular Mechanisms and Practical Applications, Natcher Building, NIH, October 7, 1997. The Dickerson-Drew Dodecamer Revisited: the Effect of Fluorine-induced Sugar Puckering on the Conformation and Stability of the Dickerson-Drew Dodecamer.

34. XIV International Round Table for Nucleosides, Nucleotides and Their Biological Applications. Montpellier, France, September 6-10, 1998. Plenary Lecture: New Conformationally Restricted Nucleosides.

35. Department of Organic Chemistry, Chemistry Faculty, University of Barcelona, Barcelona, Spain, September 14, 1998. Synthetic Approaches to Bicyclo[3.1.0]hexane Carbocyclic Nucleosides.

36. First International Conference on Inhibitors of Protein Kinases, ICM Institute, Univesity of Warsaw, Warsaw, Poland, September 15-20, 1998. Plenary Lecture: The Transition from a Pharmacophore-Guided Approach to a Receptor-Guided Approach in the Design of Potent Protein Kinase C Ligands.

INVITED LECTURES (cont.)

37. Florida Institute of Technology, Department of Biological Sciences, Melbourne, FL, October 5, 1998. Protein kinase C as a promising target for the development of a novel class of antitumor agents directed to the regulatory domain of the enzyme. A perspective in drug design.

38. Third NIH Symposium on Therapeutic Oligonucleotides: Discovery and Milestone Achievements, Bethesda, MD., December 4, 1998. Mechanism of Inhibition of DNA-(Cytosine C5) Methyltransferases by Oligonucleotides Containing 5,6-Dihydro-5-Azacytidine.

39. 14th Winter Fluorine Conference, St. Petersburg Beach, Florida, January 21, 1999. Plenary Lecture: Effect of Fluorine Substitution on Nucleoside Conformation and Their DNA-Containing Oligomers.

40. Department of Bioorganic Chemistry, Uppsala University, Sweden, February 9, 1999. Oligonucleotides Containing 5.6-Dihydro-5-azacytidine at CpG Sites can Produce Potent Inhibition of DNA Methyltransferase without Covalently Binding to the Enzyme.

41. Biochem Pharma, Montreal, Canada, March 9, 1999. Conformationally Locked Nucleosides as Probes to Discern the Preferred Binding Mode of Nucleosides and Nucleotides to Enzymes and Receptors.

42. Chemical Research and Development, Abbott Laboratories, North Chicago, Illinois, June 7, 1999. Synthesis of Conformationally Locked Nucleosides as Probes to Discern the Biological Activity of Nucleosides and Nucleotides. Part of the 1999 Seminars in Chemistry and Engineering.

43. 218th National Meeting of the American Chemical Society, Division of Carbohydrate Chemistry, Symposium on Bioactivation of Nucleoside Analogues, August 23, 1999, New Orleans, LA. “What changes in coformational parameters can be induced by phosphorylation in conformationally biased nucleosides?”

44. Department of Biochemistry and Molecular Biology, University of Maryland School of Medicine, 108 North Greene Street, Baltimore, MD. April 10, 2000. How much structural complexity is necessary for high binding affinity to protein kinase C?

45. Carbocyclic Nucleosides/tides Symposium, 32nd American Chemical Society Central Regional Meeting, Northen Kentucky Convention Center, Covington, KY, May 16, 2000. Intramolecular cyclopropanation approaches to methanocarbocyclic nucleosides and the use of these rigid molecules as biological probes.

INVITED LECTURES (cont.)

46. 220th National Meeting of the American Chemical Society, Division of Carbohydrate Chemistry, Symposium on Inosine Monophosphate Dehydrogenase (IMPDH); Perspectives on a Major Therapeutic Target, August 21, 2000, Washington, DC. Discovery of thiazole-4-carboxamide adenine dinucleotide (TAD) and recent synthetic approaches used in the construction of hydrolytically-resistant surrogates.

47. The Jack Fox Satellite Symposium, September 10, 2000, San Francisco, CA. Interactions of conformationally biased north and south 2'-fluoro-2',3'-dideoxynucleoside 5' triphosphates with the active site of HIV-1 reverse transcriptase.

48. XIV International Round Table, Nucleosides, Nucleotides and Their Biological Applications. San Francisco, CA, September 10-14, 2000. Plenary lecture: Inhibition of (cytosine C5)-methyltransferase by oligodeoxynucleotides containing flexible (cyclopentane) and conformationally constrained (bicyclo[3.1.0]hexane) abasic sites.

49. 2000 NIH/CBI Symposium, The Ohio State University, Columbus, Ohio, November 16, 2000. Synthetic approaches to conformationally locked methanocarbocyclic nucleosides and their use as biological probes.

50. Lombardi Cancer Center, Georgetown University, Washington, DC, December 1, 2000. How much structural complexity is necessary for high binding affinity to protein kinase C?

51. 15th Winter Fluorine Conference, St. Petersburg Beach, Florida, Jan. 16, 2001. A closeup view at the active site of HIV reverse transcriptase with conformationally biased North and South 2'-fluoro-2',3'-dideoxynucleoside triphosphates

52. HIV DRP Seminar, Frederick MD, January 23, 2001. Nucleoside analogues as anti-HIV agents: The role of conformation in the processes of activation and interaction with the target enzyme reverse transcriptase.

53. 84th Canadian Chemical Society Conference & Exibition, May 26-30, Montreal 2001. Intramolecular Cyclopropanation Approaches to Methanocarba Nucleosides and Their Use as Biological Probes, Presented at the Symposium on Medicinal Chemistry of Nucleosides and Nucleotides in Honor of Professor Kelvin K. Ogilvie.

54. University of Santiago de Compostela, Chemistry Department, Santiago de Compostela, Spain, July 10-13, 2001. Series of Lectures entitled "Temas Especiales en Química Orgánica" with the following topics: Lecture 1. Conformational properties of nucleosides. Principles and definitions supporting the concept of conformationally locked nucleosides. Lecture 2. Synthetic approaches to conformationally locked nucleosides based on a bicylo[3.1.0]hexane scaffold. Lecture 3. The role of nucleoside and oligonucleotide conformation in binding their biological targets.

INVITED LECTURES (cont.)

55. National Cancer Institute, Therapeutic Oligonucleotide Interest Group (TOIG) Seminar Series, National Institutes of Health, Building 10, Medical Board Room, 2C116, Bethesda, Maryland, August 23, 2001. Inhibition of (Cytosine C5)-methyltransferase by oligonucleotides containing flexible (cyclopentane) and conformationally constrained (bicyclo[3.1.0]hexane) abasic sites.

56. Guest Speaker at CV Therapeutics, 3172 Porter Drive, Palo Alto, CA; October 4, 2001. Lecture: Intramolecular cyclopropanation approaches to methanocarba nucleosides and their use as biological probes.

57. National Cancer Institute at Frederick. Fall/Winter Seminar Series. November 7, 2001, Bldg. 549 Auditorium, NCI-Frederick, MD. The first example of an isozyme-specific activator of protein kinase C (PKC). Differential activation of a classic (cPKC) versus a novel (nPKC) isozyme.

58. NCI Molecular Targets Retreat, Xerox Center, Leesburg, Virginia, November 15, 2001. An example of an isozyme-specific activator of protein kinase C (PKC): Differential activation of a classic (nPKC) versus a novel (nPKC) isozyme.

59. Second HIV DRP Symposium on Antiviral Drug Resistance, December 9-12, 2001, Westfields Marriott, Chantilly, Virginia. Structural design of nucleosides to probe their affinity for kinases, polymerases and other nucleoside/nucleotide processing enzymes.

60. Strategic Research Institute Conference on Protein Kinases & Phosphatases in Drug Discovery & Development, March 4-5, 2002, San Diego, California. An example of an isozyme-specific activator of protein kinase C (PKC): Differential activation of a classical (cPKC) versus a novel (nPKC) isozyme.

61. Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, 984525 University Medical Center, Omaha, NE, May 20, 2002. An example of an isozyme-specific activator of protein kinase C (PKC): Differential activation of a classical (cPKC) versus a novel (nPKC) isozyme.

62. National Cancer Institute, 10th SPORE Investigator's Workshop, July 13-16, 2002, Westfields Marriott Conference Center, Chantilly, VA. Zebularine: A New DNA Methylation Inhibitor with Clinical Promise.

63. XV International Round Table (IRT) on Nucleosides, Nucleotides and Nucleic Acids, Leuven, Belgium, September 11-14, 2002. Plenary Lecture: Recent Advances in the synthesis of conformationally locked nucleosides and their success in probing the critical question of conformational preferences by their biological targets.

INVITED LECTURES (cont.)

64. Sixth NIH Symposium on Therapeutic Oligonucleotides: Antisense, RNAi, Triple-Helix, Gener Repair, Enhancer-Decoy, CpG & DNAChips. December 16 & 17, 2002, Masur Auditorium, NIH, Bethesda, MD. Substitution of the internal cytosine in the GCGC recognition domain of DNA methylase by the aglycon of 3-hydroxypyrimidine-2-one riboside (zebularine) leads to potent inhibition of the enzyme. Zebularine a drug capable of activating silenced tumor suppressor genes in vivo.

65. Pfizer Seminars in Medicinal Chemistry, March 6, 2003, The University of Michigan, Ann Arbor, MI. Locked nucleosides as tools to discriminate the conformational preferences of kinases and polymerases. Novel concepts in antiviral and anticancer drug design.

66. Belleau Memorial Lecture, March 18, 2003, McGill University, Montreal, Canada. The first direct evidence that kinases and polymerases discriminate on the basis of sugar conformation.

67. The Purdue University Cancer Center and Department of Medicinal Chemistry & Molecular Pharmacology Seminar Series, April 24, 2003. Locked nucleosides as tools to discriminate the conformational preferences of kinases and polymerases. Novel concepts in antiviral and anticancer drug design.

68. XIII Congreso Nacional SEQT, Santiago de Compostela, Spain, September 9-12, 2003. Plenary Lecture: Novel carbocyclic nucleosides and the design of substrates specifically recognized by cellular or viral kinases and DNA polymerases.

69. Strategic Research Institute Conference of Protein Kinases in Drug Discovery and Development, October 20-22, 2003, Philadelphia PA. Diacylglycerols (DAGs) and DAG-lactones: Differential Binding Modes to PK-C and the Search for Isozyme Specificity.

70. Gilead Sciences, Inc. 333 Lakeside Drive, Foster City, CA, November 20, 2003. Title: The First Direct Evidence that Kinases and Polymerases Discriminate on the Basis Sugar Conformation.

71. Chemistry Department, University of New Mexico Seminar Series, April 16, 2004. Synthesis of novel carbocyclic nucleosides designed as specific substrates for cellular or viral kinases and DNA polymerases.

72. The 14th Annual Meeting of the Society of Biomedical Research, August 2-5, 2004, Marriott Hotel-Washingtonian Center, Gaithersburg, Maryland. Chemical Libraries of Novel Diacylglycerol Lactones Targeting Specific C1 Domains of Protein Kinase C (PKC) Isozymes and Non-PKC Phorbol Ester Receptors.

INVITED LECTURES (cont.)

73. XVI International Round Table for Nucleosides, Nucleotides and Nucleic Acids. Minneapolis, Minnesota, September 12-16, 2004. Plenary Lecture: Zebularine: A unique molecule for an epigenetically-based strategy in cancer chemotherapy. The magic of its chemistry and biology.

74. NIH Research Festival, September 28 - October 1, 2004 Symposium on NIH Pharmacology and Therapeutics. The Road to Identification of Molecular Targets and Their Structures. Invited lecture: First Examples of Isozyme-Specific Activators of Protein Kinase C (PKC) and Other Non-Kinase Phorbol Ester Receptors.

75. Fifth NIH Hispanic Scientist Day, Lipsett Auditorium, Bldg. 10, Bethesda, MD, October 13, 2004. Keynote presentation: Zebularine: A Molecule Destined for Clinical Trials as a Candidate for Cancer Epigenetic Therapy. The Magic of Its Chemistry and Biology.

76. Therapeutic Oligonucleotide Interest Group Seminar: Synthesis and Characterization of ODNs Containing Bicyclo[3.1.0]hexane Nucleosides and Visualization of an Intermediate in the DNA Base-flipping Pathway with Conformationally Locked OND Substrates. October 28, 2004, Bldg. 10, Room 2C116, NIH, Bethesda, MD.

77. Tohoku Pharmaceutical University, Sendai, Japan. Lecture: Chemical Libraries of Novel Diacylglycerol Lactones Targeting Specific C1 Domains of Protein Kinase C (PKC) Isozymes and Non-PKC Phorbol Ester Receptors. Sendai, Japan, November 8, 2004.

78. 31st Symposium on Nucleic Acids Chemistry. Plenary Lecture: Chemical and Biological Consequences of Locking the Conformation of Nucleosides at the Two Antipodal Extremes of the Pseudorotational Cycle. Tokyo, Japan. November 10-12, 2004.

79. Faculty of Medical and Pharmaceutical Sciences, Kumamoto University, Japan. Lecture: First Examples of Isozyme-Specific Activators of Protein Kinase C (PKC) and Other Non-Kinase Phorbol Ester Receptors. Kumamoto, Japan, November 15, 2004.

80. Faculty of Medical and Pharmaceutical Sciences, Department of Hematology, Kumamoto University, Japan. Lecture: Fixed Conformation Nucleoside Analogues are Effective Against Excision-Proficient HIV-RT's. Kumamoto, Japan, November 16, 2004.

81. 2nd Mini-Symposium on Chemical Genomics. Graduate School of Pharmaceutical Sciences, Kyoto University. Invited Lecture: Chemical Libraries of Novel Diacylglycerol Lactones Targeting Specific C1 Domains of Protein Kinase C (PKC) Isozymes and Non-PKC Phorbol Ester Receptors. Kyoto, Japan, November 17, 2004.

82. Seventh NIH Symposium on Therapeutic Oligonucleotides: Transcriptional and Translational Strategies for Silencing Gene Expression. Invited Lecture: Zebularine in Cancer Chemotherapy. National Institutes of Health, Bethesda, MD, December 13-14, 2004.

INVITED LECTURES (cont.)

83. Second "Annual Mastering Medicinal Chemistry. Applying Organic Chemistry to Biological Problems" Program. Organized by Cambridge Healthtech Institute. Invited Lecture: Novel PKC Agonist Design. Moscone North Convention Center, San Francisco, CA, April 20-22, 2005.

84. University of Maryland Baltimore Campus. Invited Seminar: Understanding How the Herpes Thymidine Kinase Orchestrates Optimal Sugar and Nucleobase Conformations to Accommodate its Substrate at the Active Site. A Chemical Approach. May 10, 2005.

85. Depto. Bioquímica, Fac. Medicina, Universidad Nacional Autónoma de México. Cd. Universitaria, México, DF. MEXICO 2005. Invited seminar: Diseño molecular de lactonas de diacilglicerol (DAG-lactonas) como activadores específicos de isozimas de la proteína cinasa C y de otras proteínas con receptores similares. August 8, 2005.

86. Northeastern University Colloquium in Chemical Biology. Invited seminar: Understanding how the herpes thymidine kinase orchestrates optimal sugar and nucleobase conformations to accommodate its substrate at the active site: A chemical approach, Northeastern University, Dept. of Chemistry and Chemical Biology, 102 Hurtig Hall, Boston MA 02115. October 26, 2005.

87. Biochemical Physiology Section Seminar: The Use of Combinatorial Libraries in the Discovery of Isozyme-Specific Activators of Protein Kinase C (PKC) and Other Non-Kinase Phorbol Ester Receptors. PCCMB, NHLBI, NIH, Bldg. 10, Rm 5N307, 9000 Rockville Pike, Bethesda, MD, November 17, 2005.

88. Implications of Sugar Ring Conformations in Drug Design: A Symposium in Memory of Muttaiya Sundaralingam. Division of Carbohydrate Chemistry, American Chemical Society. Invited Lecture: The pseudorotational cycle as a tool for drug design and discovery, Atlanta, GA, March 25, 2006.

89. Foster Chemistry Colloquia, Department of Chemistry, University at Buffalo, The State University of New York. Invited Seminar: The pseudorotational cycle as a tool for drug design and discovery, Buffalo, NY, April 7, 2006.

90. HDR-2006. 18th Helsinki Drug Research 2006. Invited lecture: Regulatory Domains of PKC as Drug Targets. Helsinki, Finland, June 1-2, 2006.

91. 16th International Conference on Organic Synthesis (IUPAC ICOS-16), June 11-15, Mérida, Yucatán, México. Invited Lecture: The landscape of DNA methylase inhibitors: From single nucleosides to oligodeoxynucleotides.

INVITED LECTURES (cont.)

92. XVII International Round Table for Nucleosides, Nucleotides and Nucleic Acids. Bern, Switzerland, September 3-7, 2005. Invited Lecture: Rearranging the bicyclo[3.1.0]hexane template of carbocyclic nucleosides to improve binding recognition by kinases.

93. University of Barcelona, Barcelona, Spain. Chemistry Department Seminar Series, September 12, 2006. Title: The landscape of DNA methylase inhibitors: From single nucleosides to modified oligodeoxynucleotides.

94. Instituto de Quimica Medica (CSIC) Juan de la Cierva, Madrid, Spain. September 14, 2006. Title: Recent advances in understanding how the herpes thymidine kinase orchestrates optimal sugar and nucleobase conformations to accommodate its substrate at the active site: A chemical approach.

95. Welsh School of Pharmacy, Cardiff University, Cardiff, UK. Fall semester seminar series. Seminar 1, September 18, 2006. Title: Recent advances in understanding how the herpes thymidine kinase orchestrates optimal sugar and nucleobase conformations to accommodate its substrate at the active site: A chemical approach. Seminar 2. Title: The landscape of DNA methylase inhibitors: From single nucleosides to modified oligodeoxynucleotides.

96. NIH Research Festival. Synthesis and Biological Activity of Drug-like Molecules: From Design and Development to Medicinal Applications Symposium Session III, Wednesday, October 18, 2006, 2:30 - 4:30 pm, Natcher, Conference Room F1/F2. "The investigation of a conformational concept leads to the discovery of a potent and selective nucleoside antiviral agent against Kaposi sarcoma"

97. Florida International University, Miami, Florida, USA. Fall semester seminar series, October 27, 2006. Title: Recent advances in understanding how kinases and polymerases orchestrate optimal sugar and nucleobase conformations to accommodate their substrates at the active site: A chemical approach.

98. Wayne State University, Detroit, Michigan, USA. Fall semester seminar series, November 17, 2006. Title: The landscape of DNA methylase inhibitors: from single nucleosides to modified oligodeoxynucleotides.

99. University of Southern California, Norris Cancer Center Ground Rounds, Los Angeles, CA, January 30, 2007. Title: The landscape of DNA methylase inhibitors: from single nucleosides to modified oligodeoxynucleotides.

INVITED LECTURES (cont.)

100. Distinguished Faculty, Cambridge Healthtech Institute Conference on Epigenomics: Applying DNA methylation and histone acetylation to diagnostic and drug development. March 19-20, 2007, San Diego, CA. Topic: The landscape of DNA methylase inhibitors: from single nucleosides to modified oligodeoxynucleotides.

101. Invited Speaker Seminar, Laboratory of Cancer Biology and Genetics, Center for Cancer Research, National Cancer Institute, National Institutes of Health, Bethesda, MD 20892; June 14, 2007. Topic: Chemistry as an Engine of Discovery at NCI.

102. Gordon Research Conference on Nucleosides, Nucleotides & Oligonucleotides, Salve Regina University, Newport, RI, July 1-6. 2007. Topic: The properties of locked methanocarba nucleosides in Biochemistry, Biotechnology, and Medicinal Chemistry.

103. Leopoldo García-Colín-Scherer Medal Award Lecture. Third Mexican Meeting on Mathematical and Experimental Physics, Mexico City, Mexico (Sept 10-14, 2007). Title: The Interface of Chemistry, Biology and Physics in the Rational Design of Biologically Active Small Molecules.

104. Universidad Autónoma Metropolitana Iztapalapa, Mexico City, September 18, 2007. Seminar title: Chemistry as an Engine of Discovery.

105. University of Murcia, Spain, Department of Molecular Biology and Biotechnology, November 28, 2007. Topic: DAG-lactone chemical “zip codes” are decoded by cells into a plethora of diverse and selective biological activities.

106. Congress on Epigenetics and New Therapies in Cancer, Madrid, Spain, November 29-30, 2007. Topic: The design of mechanism based small-molecule inhibitors of DNA methyltransferases: nucleosides, nucleotide prodrugs and oligodeoxynucleotides.

107. Universität Hamburg, Organisch-Chemisches Kolloquium, Hamburg, Germany, December 4, 2007. Topic: The Interface of Chemistry, Biology and Physics in the Rational Design of Biologically Active Small Molecules.

108. Laboratory Experimental Carcinogenesis, National Cancer Institute, CCR, February 8, 2008. Topic: The design of mechanism based small-molecule inhibitors of DNA methyltransferases: nucleosides, nucleotide prodrugs and oligodeoxynucleotides.

109. Chemistry Colloquium, Auburn University, Auburn, Alabama. February 29, 2008. Topic: The Interface of Chemistry and Biology in the Rational Design of Biologically Active Carbocyclic Nucleosides.

INVITED LECTURES (cont.)

110. Frontiers at the Chemistry and Biology Interface Symposium, Department of Chemistry and Biochemistry, University of Maryland at College Park, Saturday April 12, 2008. Topic: D-(+)-iso-Methanocarbathymidine, a High Affinity Substrate for HSV-tk.

111. Chemistry Department, The City College of New York, May 12, 2008. Topic: The Interface of Chemistry and Biology in the Rational Design of Biologically Active Carbocyclic Nucleosides.

112. Division of Carbohydrate Chemistry, 236th American Chemical Society Meeting, Philadelphia, PA, August 19, 2008. Topic: The Properties of locked methanocarba nucleosides in biochemistry, biotechnology and medicinal chemistry.

113. 91st IBB Seminar at the Medical and Dental University of Tokyo, Tokyo, Japan. September 8, 2008. Topic: Cells sort diacylglycerol-lactone chemical zip codes to produce diverse and selective biological activities.

114. HIV and AIDS Malignancy Branch Seminar, Clinical Center, Room 5-2550, Bethesda, Maryland, September 29, 2008. Topic: Potent activity of North-methanocarbathymidine against Kaposi's sarcoma-associated herpesvirus.

115. Maryland Chemist of the Year Award Lecture, December 10, 2008, Towson, Maryland. Topic: The ribose ring of nucleosides: What can it teach us about evolution, chemistry and drug design?

116. Chemistry and Structural Biology Faculty Seminar Series, March 19, 2008, Bethesda, Maryland. Presented jointly with Stephen H. Hughes. Topic: Developing Nucleoside Analogs Effective Against Drug-Resistant HIV-1s.

117. 2008 Raymond U. Lemieux Lecture on Biotechnology, University of Alberta, Edmonton, Alberta, Canada, May 7, 2009. Topic: What are the consequences of freezing the anomeric effect in nucleosides.

118. Frontiers in Bioorganic Chemistry, Uppsala University, Sweden, May 15, 2009. Topic: What are the consequences of freezing the anomeric effect in nucleosides.

119. National Cancer Institute at Frederick, Frederick Faculty Seminar Series, May 27, 2009, Bldg. 549 Auditorium, NCI-Frederick, MD. Highlights of 32 years of Drug Design and Chemistry at the NCI.

120. The Pharmaceutical Society of Korea 2009 Fall International Convention, October 15-16, 2009, Seoul, S. Korea. Plenary Lecture: Chemical Libraries of Diacylglycerol Lactones Targeting C1 domains.

INVITED LECTURES (cont.)

121. EWA University, S. Korea, October 17, 2009. Invited lecture: The ribose ring of nucleosides: What can it teach us about evolution, chemistry and drug design?

122. American Association for Cancer Research, Washington D.C., April 17, 2010, Educational Session on New Targets and Novel Drugs for microRNAs and the Epigenetic Machinery. Lecture: Recent Developments of two NCI epigenetic drugs: Zebularine and 3-Deazaneplanocin A.

123. First International Workshop on Epigenetic Cancer Therapy, German Cancer Research Center, Heidelberg, Germany, June 17-19, 2010. Invited Lecture: The Choreography Between DNA and Histone Methylation in Cancer.

124. XIX International Round Table on Nucleosides, Nucleotides and Nucleic Acids, Lyon, France - 29th August - 3rd September 2010. Plenary Lecture: Contrasting Biological Roles of Locked Nucleosides Situated on the Antipodal Regions of the Pseudorotational Cycle.

125. 3rd NAC Minisymposium Nucleic Acid Chemical Biology anno 2011, Nucleic Acid Center, University of Southern Denmark, Odense, Denmark. Lecture: 4-(Hydroxymethyl-2-oxabicyclo[3.1.0]hexane Pyrimidine Nucleosides: A New Template for Conformationally Locked Nucleosides.

126. University of Michigan, School of Graduate Studies, Centennial Lecturer, Interdepartmental Program in Medicinal Chemistry, October 4, 2012. Lecture: Conformationally Locked Nucleosides as Tools to Unlock Nature's Secrets.

PATENTS

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